

*March 30, 1882.*

THE PRESIDENT (followed by THE TREASURER) in the Chair.

The Right Hon. Anthony John Mundella was admitted into the Society.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read :—

- I. “On the Development of the Ossicula Auditus in the Higher Mammalia.” By ALEXANDER FRASER, M.B., &c., Senior Demonstrator of Anatomy, the Owens College, Manchester. Communicated by Dr. ALLEN THOMSON, F.R.S. Received March 16, 1882.

(Abstract.)

The paper begins by a history of the various views held up to the present date concerning the origin of the Ossicula Auditus.

The author then describes the methods of preparation, and the results of his own observations made upon complete series of sections from the rat, pig, sheep, dog, rabbit, calf, mouse, and human embryos at different developmental stages. He gives a short anatomical sketch of the parts in connexion with the proximal extremities of the first two post-oral cartilages, including the ganglion, the maxillary and mandibular branches of the fifth nerve, the seventh nerve, and its mandibular (chorda tympani) branch (noting the relation which this branch bears to the hyoidean cartilage, and the long crus of the incus), the auditory vesicle and its capsule with the difference in development between the oval and round fenestræ, the primitive jugular vein, the hyo-mandibular cleft (and its non-perforation in the region of the membrana tympani), and the tympanic annulus.

The author describes the malleus as having its origin in the proximal extremity of the mandibular cartilage, the apex of which, growing in a ventral direction, depresses the dorsal wall of the meatus auditorius externus upon the ventral, and thus becomes the manubrium of the malleus. He further compares the embryonic ossicula with their form in the adult, and traces the origin from the mandibular cartilage of certain parts in the adult malleus of Mammalia of great morphological significance.

He has ascertained that the head of the incus is the proximal extremity of the hyoidean cartilage, the long crus forming the connecting part between it and the remainder of the cartilage. The short crus is a later growth backwards from the head of the incus. This ossicle agrees in its histological characters with the hyoidean cartilage and not with the mandibular. The mandibular branch of the seventh nerve bears also the same relation to its long crus in the human embryos as it bears to the hyoidean cartilage.

The orbicular apophysis is shown to be a part of the long crus, which turns inwards to accommodate itself to the stapes at right angles to its former direction; its constricted pedicle is not formed until after birth.

The cells of the embryonic stapes appear contemporaneously with those forming the embryonic cartilage in the arches, or those forming the periotic capsule; they are arranged in a circular form round an artery, which may either disappear very early, as in the human embryo, or persist through life, as in the rat. In the former case it is called *arteria stapediales*, in the latter *arteria stapedio-maxillaris*. This circular ring is at first of equal thickness all round, and is not even in contact with the periotic capsule, but is more closely connected with the hyoidean cartilage, although its cells cannot be described as continuous with the cells of that cartilage, their long axes having a circular and not an antero-posterior direction.

Owing chiefly to the growth of the cochlear part of the labyrinth, the stapes applies itself to the wall of that cavity; forms a depression there, the future fenestra ovalis; the margins of its base and the head are the last to develop.

The articulation between the head of the stapes and the long crus of the incus is formed at the same time as that between the malleus and incus. The tubercle on its posterior crus bears the same relation to the stapedius muscle as the *processus muscularis* of Hyrtl to the tensor tympani. The stapedius muscle agrees in its development with the tensor tympani, or any other muscle in the region of the head, and the nucleus in its tendon, which has been described as an inter-hyal, has no connexion with the hyoidean cartilage, in truth, not being present at all in any of the embryos on which I have worked; so that when it is present it must be looked upon as a development in a tendon similar to that which occurs in many other muscles of the body.

The author was anticipated by Salensky in the publication of the discovery of the peculiar mode of origin of the stapes round an artery; but his observation of this fact was made independently of Salensky's, and before the appearance of that writer's memoir, and he has been able both to correct and to add considerably to Salensky's description of the development of this ossicle.